

# Union Calendar No. 528

114TH CONGRESS  
2D SESSION

# H. R. 5638

[Report No. 114-680]

To provide for the establishment at the Department of Energy of a Solar Fuels Basic Research Initiative.

---

## IN THE HOUSE OF REPRESENTATIVES

JULY 6, 2016

Mr. KNIGHT (for himself, Mr. LIPINSKI, Mr. SMITH of Texas, Mr. WEBER of Texas, Mr. NEUGEBAUER, Mr. HULTGREN, Mr. POSEY, Mr. MOOLENAAR, and Mr. BABIN) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

JULY 11, 2016

Reported with an amendment, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed

[Strike out all after the enacting clause and insert the part printed in italic]

[For text of introduced bill, see copy of bill as introduced on July 6, 2016]

# A BILL

To provide for the establishment at the Department of Energy of a Solar Fuels Basic Research Initiative.

1       *Be it enacted by the Senate and House of Representa-*  
2   *tives of the United States of America in Congress assembled,*  
3   **SECTION 1. SHORT TITLE.**

4       *This Act may be cited as the “Solar Fuels Innovation*  
5   *Act”.*

6   **SEC. 2. SOLAR FUELS BASIC RESEARCH INITIATIVE.**

7       *(a) AMENDMENT.—Section 973 of the Energy Policy*  
8   *Act of 2005 (42 U.S.C. 16313) is amended to read as fol-*  
9   *lows:*

10   **“SEC. 973. SOLAR FUELS BASIC RESEARCH INITIATIVE.**

11       “(a) INITIATIVE.—

12           “(1) IN GENERAL.—*The Secretary shall carry*  
13   *out a research initiative, to be known as the Solar*  
14   *Fuels Basic Research Initiative, to expand theoretical*  
15   *and fundamental knowledge of photochemistry, elec-*  
16   *trochemistry, biochemistry, and materials science use-*  
17   *ful for the practical development of experimental sys-*  
18   *tems to convert solar energy to chemical energy.*

19           “(2) LEVERAGING.—*The Secretary shall leverage*  
20   *expertise and resources from the Basic Energy*  
21   *Sciences Program and Biological and Environmental*  
22   *Research Program within the Office of Science, and*  
23   *the Office of Energy Efficiency and Renewable En-*  
24   *ergy, as provided under subsections (b) and (c).*

1           “(3) TEAMS.—The Secretary shall organize ac-  
2         tivities under the Solar Fuels Basic Research Initia-  
3         tive to include multidisciplinary teams leveraging ex-  
4         pertise from the National Laboratories, universities,  
5         and the private sector to the extent practicable. These  
6         multidisciplinary teams shall pursue aggressive, mile-  
7         stone-driven basic research goals. The Secretary shall  
8         provide sufficient resources for those teams to achieve  
9         those goals over a period of time to be determined by  
10       the Secretary.

11           “(4) ADDITIONAL ACTIVITIES.—The Secretary is  
12         authorized to organize additional activities under this  
13         subsection through Energy Frontier Research Centers,  
14         Energy Innovation Hubs, or other organizational  
15         structures.

16           “(b) ARTIFICIAL PHOTOSYNTHESIS.—

17           “(1) IN GENERAL.—The Secretary shall, as part  
18         of the Solar Fuels Basic Research Initiative, carry  
19         out a program to support research needed to bridge  
20         scientific barriers and discover knowledge relevant to  
21         artificial photosynthetic systems. In carrying out ac-  
22         tivities under this subsection, the Director of the Of-  
23         fice of Basic Energy Sciences shall support basic re-  
24         search to pursue distinct lines of scientific inquiry,  
25         including photoinduced production of hydrogen and

1       oxygen from water, and the sustainable photoinduced  
2       reduction of carbon dioxide to fuel products including  
3       hydrocarbons, alcohols, carbon monoxide, and natural  
4       gas. The Assistant Secretary for Energy Efficiency  
5       and Renewable Energy shall support translational re-  
6       search, development, and validation of physical con-  
7       cepts developed under this subsection.

8               “(2) STANDARD OF REVIEW.—The Secretary  
9       shall review the program activities under this sub-  
10      section to determine the achievement of technical  
11      milestones.

12               “(3) AUTHORIZATION OF APPROPRIATIONS.—

13               “(A) AUTHORIZATION.—Subject to sub-  
14      section (d), there are authorized for carrying out  
15      activities under this subsection for each of fiscal  
16      years 2017 through 2020—

17               “(i) \$50,000,000 from funds within the  
18      Basic Energy Sciences Program account;  
19      and

20               “(ii) \$25,000,000 from funds within  
21      the Energy Efficiency and Renewable En-  
22      ergy account.

23               “(B) PROHIBITION.—No funds authorized  
24      under this subsection may be obligated or ex-

1           pended for commercial application of energy  
2           technology.

3         “(c) *BIOCHEMISTRY, REPLICATION OF NATURAL PHO-*  
4 *TOSYNTHESIS, AND RELATED PROCESSES.—*

5         “(1) *IN GENERAL.—The Secretary shall, as part*  
6 *of the Solar Fuels Basic Research Initiative, carry*  
7 *out a program to support research needed to replicate*  
8 *natural photosynthetic processes by use of artificial*  
9 *photosynthetic components and materials. In carrying*  
10 *out activities under this subsection, the Director of the*  
11 *Office of Basic Energy Sciences shall support basic*  
12 *research to expand fundamental knowledge to rep-*  
13 *licate natural synthesis processes, including the*  
14 *photoinduced reduction of dinitrogen to ammonia, ab-*  
15 *sorption of carbon dioxide from ambient air, molec-*  
16 *ular-based charge separation and storage,*  
17 *photoinitiated electron transfer, and catalysis in bio-*  
18 *logical or biomimetic systems. The Associate Director*  
19 *of Biological and Environmental Research shall sup-*  
20 *port systems biology and genomics approaches to un-*  
21 *derstand genetic and physiological pathways con-*  
22 *nected to photosynthetic mechanisms. The Assistant*  
23 *Secretary for Energy Efficiency and Renewable En-*  
24 *ergy shall support translational research, develop-*

1       *ment, and validation of physical concepts developed*  
2       *under this subsection.*

3           “(2) STANDARD OF REVIEW.—*The Secretary*  
4       *shall review the program activities under this sub-*  
5       *section to determine the achievement of technical*  
6       *milestones.*

7           “(3) AUTHORIZATION OF APPROPRIATIONS.—

8           “(A) AUTHORIZATION.—*Subject to sub-*  
9       *section (d), there are authorized for carrying out*  
10      *activities under this subsection for each of fiscal*  
11      *years 2017 through 2020—*

12           “(i) \$50,000,000 from funds within the  
13       *Basic Energy Sciences Program and Bio-*  
14       *logical and Environmental Research Pro-*  
15       *gram accounts; and*

16           “(ii) \$25,000,000 from funds within  
17       *the Energy Efficiency and Renewable En-*  
18       *ergy account.*

19           “(B) PROHIBITION.—*No funds authorized*  
20       *under this subsection may be obligated or ex-*  
21       *pended for commercial application of energy*  
22       *technology.*

23           “(d) FUNDING.—*No additional funds are authorized to*  
24       *be appropriated under this section. This section shall be*  
25       *carried out using funds otherwise authorized by law.”.*

1       (b) *TABLE OF CONTENTS AMENDMENT.*—The item re-  
2 lating to section 973 in the table of contents of such Act  
3 is amended to read as follows:

“Sec. 973. Solar Fuels Basic Research Initiative.”.



**Union Calendar No. 528**

114TH CONGRESS  
2D SESSION  
**H. R. 5638**

[Report No. 114-680]

---

---

**A BILL**

To provide for the establishment at the Department of Energy of a Solar Fuels Basic Research Initiative.

---

---

JULY 11, 2016

Reported with an amendment, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed